

* To Examiner Reference

Patent Claims

1. A microfocus X-ray tube for inspecting an object, comprising:

5 a head 6 that during operation of the X-ray tube faces an object that is to be inspected, wherein the head has an outer surface with a cross-section that tapers toward a free end of the head;

10 a target 8 disposed on or in said head 6 and means for forming an electron beam adapted to bombard said target 8, wherein said means form said electron beam such that said X-ray tube has a focus with a diameter of $\leq 200 \mu\text{m}$.

2. A microfocus X-ray tube according to claim 1, wherein said focus has a diameter of the $\leq 10 \mu\text{m}$.

15 3. A microfocus X-ray tube according to claim 1, wherein said outer surface of said head 6 is essentially rotationally symmetrical.

4. A microfocus X-ray tube according to claim 3, wherein said outer surface of said head 6 is essentially conical.

5. A microfocus X-ray tube according to claim 1, wherein said outer surface of said head 6 terminates in a vertex.

20 6. A microfocus X-ray tube according to claim 1, wherein said outer surface of said head 6 is formed at least partially by said target 8.

7. A microfocus X-ray tube according to claim 1, wherein said outer surface of said head 6 is formed at least partially by a collimator 24 that in a direction of irradiation is disposed ahead of said target 8

5 8. A microfocus X-ray tube according to claim 1, wherein said outer surface of said head 6, in a direction of irradiation, is formed at least partially by a holder 18 for said target 8

10 9. A microfocus X-ray tube according to claim 4, wherein said essentially conical outer surface of said head 6 has an opening angle of less than 50°.

10. A microfocus X-ray tube according to claim 4, wherein said head 6 is provided with at least two regions, disposed one after the other in an axial direction, having different opening angles of the conical outer surface.

15 11. A microfocus X-ray tube according to claim 1, wherein said target 8 is a transmission target.

20 12. A target for the X-ray tube of claim 1, wherein an outer surface 10 of said target 8 has a cross-section that tapers toward an end of said target that during operation of said X-ray tube faces an object that is to be inspected.

13. A target according to claim 12, wherein said outer surface of said target 8 is essentially rotationally symmetrical.

14. A target according to claim 12, wherein said outer surface of said target 8 is essentially conical.

15. A target according to claim 12, wherein said outer surface of said target 8 terminates in a vertex 12

5 16. A collimator for the target of said X-ray tube of claim 1, wherein an outer surface 28 of said collimator 24 has a cross-section that tapers toward an end of said collimator that during operation of said X-ray tube faces an object that is to be inspected.

10 17. A collimator according to claim 16, wherein said outer surface is essentially rotationally symmetrical.

18. A collimator according to claim 16, wherein said outer surface is essentially conical.

19. A collimator according to claim 16, wherein said outer surface terminates in a vertex.

15 20. A collimator according to claim 16, wherein said collimator 24 has a continuous opening 26 that extends in an irradiation direction of an X-ray beam.